



Solar and nuclear energy expertise to be enhanced by research centers

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LOS ALAMOS, New Mexico, May 12, 2009—Solar- and nuclear-energy technology advancements from Los Alamos National Laboratory (LANL) could help the nation in its quest to capture viable sources of alternative energy, thanks to funding from the U.S. Department of Energy's Office of Science.

Los Alamos will be home to two new Energy Frontier Research Centers (EFRCs)—each designed to advance scientific research in alternative and renewable energy—through a five-year funding commitment by DOE. Forty-six such centers will be established nationwide at national laboratories, universities, nonprofit organizations, and private firms. The two LANL centers each will receive \$3.8 million a year in funding (\$19 million each total over the five-year term).

One center, led by Los Alamos National Laboratory Fellow Victor Klimov, will focus on exploiting the physical properties of nanomaterials (compilations of structures so tiny they can't be seen by the human eye) to more efficiently convert solar energy into electric power, or develop materials such as highly efficient solar collectors that could be painted onto a surface to generate electricity. At the center of this research are quantum dots, extremely tiny semi-conducting materials with the ability to generate more than one electrical-energy unit (electron) per single light unit (photon)—an improvement over today's solar cells.

"Engineered nanostructures such as quantum dots have the ability to harvest light more efficiently than silicon," Klimov said. "Quantum dots and similar nanomaterials show tremendous potential in numerous applications that could make solar energy a more viable alternative energy source."

The other center, led by Los Alamos National Laboratory Fellow Michael Nastasi, will focus on developing robust materials that will be able to withstand extreme conditions such as constant bombardment by radiation or around-the-clock mechanical beatings. To develop these materials, Nastasi and his research team will develop technology to design and engineer bulk materials at the molecular level using nanomaterials.

"The goal of this research is to create materials that will withstand the rigors of next-generation nuclear of reactors to allow them to function reliably and safely for long periods of time with reduced maintenance," Nastasi said. "We will identify inherent characteristics of materials at the atomic level that allow these materials to withstand extreme environments or lead to failure within them. We would then hope to be able to selectively design and create structures at the nanoscale to exploit strengths or

eliminate weaknesses to make these materials particularly suited to surviving in extreme environments.”

In addition to leading two centers, LANL will participate in five others nationwide. Funding for the two centers does not come from the 2009 American Recovery and Reinvestment Act. More information about the EFRCs can be found at <http://www.sc.doe.gov/bes/EFRC.html>.

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